Appendix D
The Projection Button

All of the data within AILESP Version 2.1 uses the Geographic Reference System as the native spatial reference format. Features are spatially referenced using coordinate pairs of latitude and longitude. This system divides the earth, a sphere, into 360 equal parts called degrees. Each degree is subdivided into 60 minutes. Individual minutes are in turn divided into 60 seconds. When data referenced in the Geographic system is displayed on a map, a projection system must be used to account for the differences involved with referencing a three-dimensional object (the earth) to a two-dimensional map. Once a projection system has been defined for the spatial data set, the precise position of features on the Earth's surface can be obtained from the map.

When a projection is used to display geographic data on a map, distortion of some kind is introduced to the display. On large scale maps, such as street maps, the distortion caused by the map projection being used may be negligible because your map will typically cover only a small part of the Earth's surface. On smaller scale maps, such as regional and world maps, where a small distance on the map may represent a considerable distance on the Earth, this distortion may have a bigger impact, especially if your application involves comparison of the shape, area or distance of different features. In these cases, knowledge of the characteristics of the map projection you are using becomes more important.

In AILESP v.2.1 the view document has the Equidistant Conic projection predefined to display features of the conterminous United States in a realistic manner. The Equidistant Conic method has the following properties within this project:

Projection: Equidistant Conic
Spheroid: Clarke 1866
Central Meridian: -95.98
Reference Latitude: 36.95
1st Standard Parallel: 28.66333
2nd Standard Parallel: 45.23667

Remember, the view projection feature in ArcView only transforms how data is displayed within the view, and not the underlying data source itself. Some additional considerations to take when using data in the predefined projection for analysis include the following:

- Local shapes are true along the standard parallels.
- Distortion is constant along any given parallel.
- Distortion increases with distance from the standard parallels.

- Area distortion is constant along any given parallel. This distortion increases with distance from the standard parallels.
- Direction is locally true along the standard parallels.
- Distance is true along the meridians and the standard parallels.
- Scale is constant along any given parallel, but changes from parallel to parallel.

For those users who have data in a different projection system, all of the existing data within AILESP v.2.1 can be projected from geographic decimal degrees to whatever projection their existing data is in. In ArcView, the task of projecting data is completed using the Projector! button on the view button bar.

To use the Projector! script you must know the map units and projection of the datasets being projected. While in the ArcView project, the user can get instructions on the use of the Projector! script by holding down the "Shift" key and then clicking on the Projector! button. The instructions for using the script are as follows:

1. Make sure there is at least one theme present in the view.

2. Set the map units appropriately in the View Properties window. If the Projector! script is used in a view without the map units set in the View Properties window, an error message is displayed and the script stops running.

3. Make the theme(s) you wish to project active.

4. Click the Projection button  on the view button bar. You are prompted for certain information including the output units and output projection.

5. You will be asked if you want to recalculate area, perimeter and length fields using the user defined output units. If the field to be recalculated is not large enough to hold the new (calculated) number, the value put in that field will be incorrect.

6. You will be asked if you want to add the projected theme(s) to a view.

7. You will be asked for output shapefile names for each theme to be projected.

If the Projector! Script is used in a view without the map units set in the View Properties window, an error message is displayed.